

We claim:

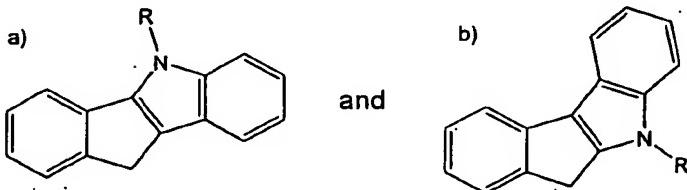
1. A catalyst system which comprises:

- (a) an organometallic complex which comprises a Group 3-10 transition metal, M, and at least one indenoindolyl ligand that is pi-bonded to M; and
- (b) an activator which comprises the reaction product of an alkylaluminum compound and an organoboronic acid.

2. The catalyst system of claim 1 wherein the organometallic complex includes a Group 4-6 transition metal.

3. The catalyst system of claim 1 wherein the organometallic complex includes a Group 4 transition metal.

4. The catalyst system of claim 1 wherein the indenoindolyl ligand has a structure selected from the group consisting of:



in which each ring atom is unsubstituted or substituted with one or more alkyl, aryl, aralkyl, halogen, silyl, nitro, dialkylamino, diarylamino, alkoxy, aryloxy, or thioether groups.

5. The catalyst system of claim 1 wherein the organometallic complex further incorporates a polymerization-stable ligand selected from the group consisting of cyclopentadienyl, indenyl, fluorenyl, boraaryl, azaborolinyl, carbazolyl, pyrrolyl, indolyl, 8-quinolinoxy, and 2-pyridinoxy.

6. The catalyst system of claim 1 wherein the organometallic complex incorporates a labile ligand selected from the group consisting of halide, alkyl, aryl, aralkyl, alkoxy, aryloxy, dialkylamino, and siloxy.

7. The catalyst system of claim 1 wherein the indenoindolyl ligand is bridged to another ligand.

8. The catalyst system of claim 1 wherein the alkylaluminum compound is selected from the group consisting of trimethylaluminum and triethylaluminum.

9. The catalyst system of claim 1 wherein the organoboronic acid is a polyfluoroaryl boronic acid.

10. The catalyst system of claim 9 wherein the polyfluoroaryl boronic acid is pentafluorophenylboronic acid.

11. The catalyst system of claim 1 further comprising an alkyl alumoxane.

12. A supported catalyst system of claim 1.

13. The catalyst system of claim 12 wherein the support is selected from the group consisting of silicas and aluminum phosphates.

14. A catalyst system which comprises:

(a) an organometallic complex which comprises a Group 4 transition metal, M, and at least one indenoindolyl ligand that is pi-bonded to M; and

(b) an activator which comprises the reaction product of (1) an alkylaluminum compound selected from the group consisting of trimethylaluminum and triethylaluminum and (2) a polyfluoroaryl boronic acid.

15. A supported catalyst system of claim 14.

16. A process which comprises polymerizing an olefin in the presence of the catalyst system of claim 1.

17. A process which comprises polymerizing an olefin in the presence of the supported catalyst system of claim 12.

18. A process which comprises polymerizing an olefin in the presence of the catalyst system of claim 14.

19. A process which comprises polymerizing an olefin in the presence of the supported catalyst system of claim 15.

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IN THE CLAIMS:

Please cancel claims 1-19 and enter new claims 20-29. A complete listing of claims now pending appears below:

Claims 1-19 (cancelled).

20. (new) A process which comprises polymerizing an olefin in the presence of a catalyst system comprising: (a) an organometallic complex which comprises a Group 3-10 transition metal, M, and at least one indenoindolyl ligand that is pi-bonded to M; and (b) an activator which comprises the reaction product of an alkylaluminum compound and an organoboronic acid.

21. (new) The process of claim 20 wherein the catalyst system is supported.

22. (new) The process of claim 21 wherein the support is selected from the group consisting of <sup>Silicas</sup> silicas and aluminum phosphates.

23. (new) The process of claim 20 wherein the olefin is ethylene or a mixture of ethylene with one or more C<sub>3</sub>-C<sub>20</sub> α-olefins.

24. (new) The process of claim 23 wherein the olefin is ethylene or a mixture of ethylene with one or more C<sub>3</sub>-C<sub>10</sub> α-olefins.

25. (new) A process which comprises polymerizing an olefin in the presence of a catalyst system comprising: (a) an organometallic complex which comprises a Group 4 transition metal, M, and at least one indenoindolyl ligand that is pi-bonded to M; and (b) an activator which comprises the reaction product of (1) an alkylaluminum compound selected from the group consisting of trimethylaluminum and triethylaluminum and (2) a polyfluoroaryl boronic acid.

26. (new) The process of claim 25 wherein the catalyst system is supported.

27. (new) The process of claim 26 wherein the support is selected from the group consisting of <sup>Silicas</sup> silicas and aluminum phosphates.

**28. (new) The process of claim 25 wherein the olefin is ethylene or a mixture of ethylene with one or more C<sub>3</sub>-C<sub>20</sub> α-olefins.**

**29. (new) The process of claim 28 wherein the olefin is ethylene or a mixture of ethylene with one or more C<sub>3</sub>-C<sub>10</sub> α-olefins.**